Detector Support Group

We choose to do these things "not because they are easy, but because they are hard".

Weekly Report, 2022-02-23

Summary

Hall A – ECal

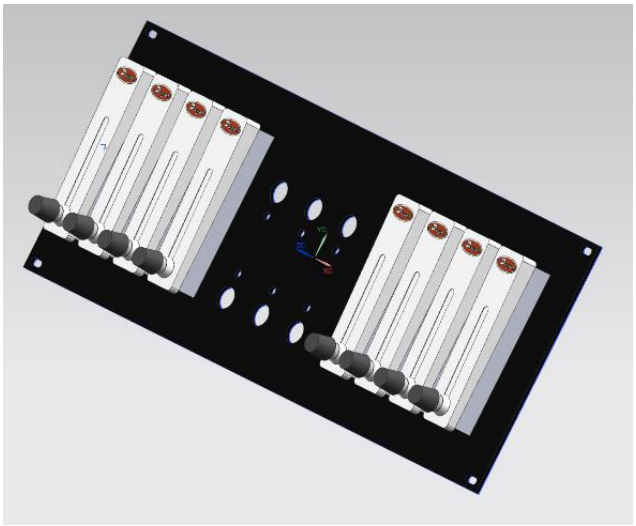
George Jacobs, Mindy Leffel, and Marc McMullen

- Assembling supermodules – 24 of 59 complete
  - ✶ Measured 253 of 514 lead-glass assemblies

Hall A – GEM

Brian Eng, George Jacobs, and Marc McMullen

- Rendering, using NX12, three-dimensional model of flow meter valve panel



Front view of BigBite manual flow meter panel

Hall A – SoLID

Pablo Campero, Mindy Leffel, and Marc McMullen

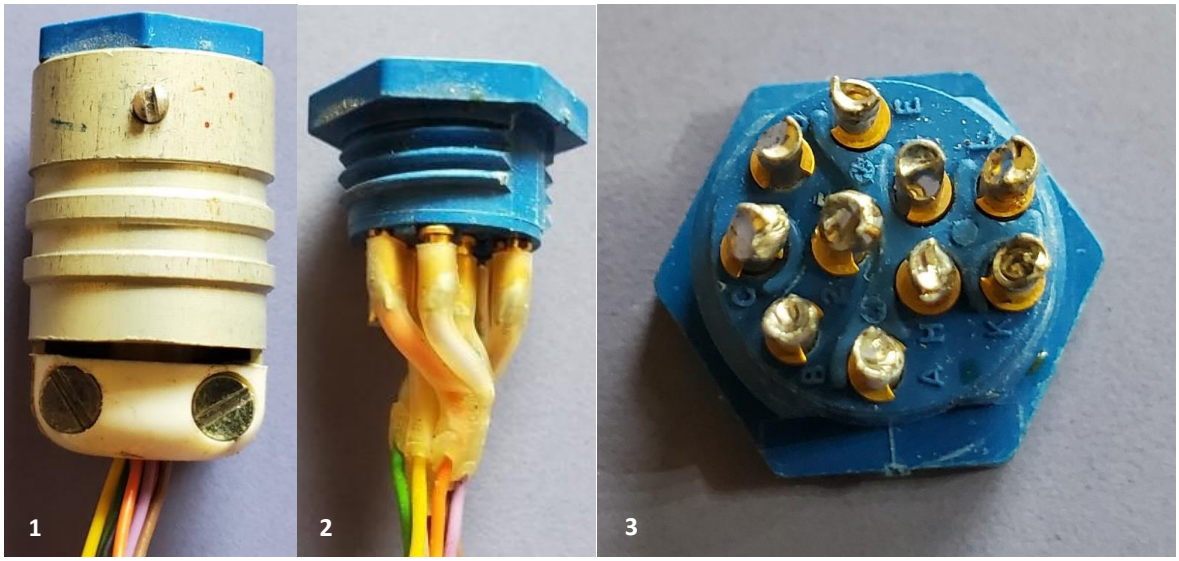
- Generating PLC tag list for cryogenic variables
- Solved valve control issues
  - ✶ Reconnected wire in PLC relay module's terminal block and tightened connection in terminal strips
  - ✶ Tested operation of each of the 24 relays in motor controller relay (MCR) board in local and remote modes
  - ✶ Swapped wires on MCR board to solve issue of reverse switch opening and closing of the heat exchanger valves
  - ✶ Noticed that test valve's motor rotation was incorrect due to incorrect connection
    - Test valve connector has different pinout color assignment compared to the one that will be used for the actual valves
    - Reconnected test valve to control rack's terminal strip and achieved proper rotation
  - ✶ Tested controls for all valves in local and remote modes; all worked as expected

- Debugged voltmeter (Red Lion) device to monitor valve position for LVDT module in local mode
  - ✶ Checked specifications for voltmeter and LVDT module; pinout of LVDT module did not match actual wiring connection
  - ✶ Rewired connections between LVDT and voltmeter for seven valves
    - Replaced single-level terminal blocks with 2-level terminal blocks
  - ✶ Tested proper readout in voltmeter for seven valves
- Tested constant current source boards
  - ✶ All six boards installed in rack worked as expected
  - ✶ There are two available spares that can be used for rhodium-iron and diode temperature sensors
  - ✶ Testing a third spare board that could be used for PT-102 temperature sensors
  - ✶ Recorded voltage and current measurements for all boards

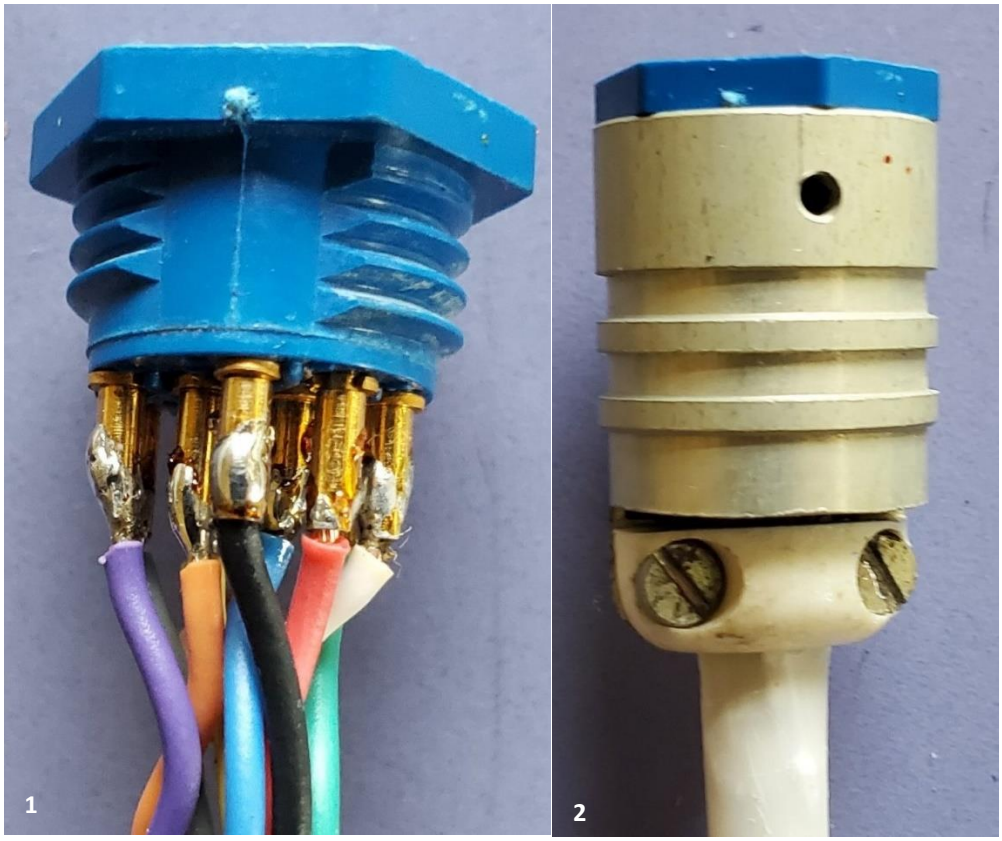
Constant current source boards #s 1-6 installed in Rack A

- Fabricating 100' long cables
  - ✶ Looked at connectors required for temperature sensors
  - ✶ Added information for connectors' pins and wire colors
- Terminated 10, four-conductor cables with Trim Trio connectors for LVDT for valve readout
- Terminating temperature sensor cables with used MIOS connectors; 10 of 14 complete

- Procedure requires disassembling connector, removing heat shrink, de-soldering old wires, and reassembly
- Used old connectors so as not to replace connectors on the turret



MIOS connector prior to refurbishment: (1) terminated connector with outer shell, (2) outer shell removed, (3) wires removed



MIOS connector after new wires have been soldered to connector (1) and the outer shell replaced (2)

Hall B – RICH-II

Mary Ann Antonioli, Peter Bonneau, Pablo Campero, Brian Eng, George Jacobs, Tyler Lemon, and Marc McMullen

- Developed EPICS server for hardware interlock system and LabVIEW code to allow users to write to system controls using EPICS
  - ✶ sbRIO programmatically creates server, creates all PVs following naming convention used for RICH-I, and deploys server
  - ✶ Added LabVIEW code enables controls to set hardware interlock program to LabVIEW control mode or EPICS control mode
    - LabVIEW control mode needed to control hardware interlock program using LabVIEW expert user interface or program's front panel
- Continued set up of long-term tests of the RICH-II hardware system
  - ✶ Connected all RJ45-Molex cables to hardware interlock chassis and found five cables that needed exterminating
  - ✶ Need two additional RJ45-Molex cables to complete system cabling
  - ✶ As of 02/22/2022, 17 of 24 SHT35 sensor PCBs (34 total sensors) can be read without issue
    - Remaining seven PCBs (14 sensors) will be read once cables are fabricated
- 3D printed three more batches of spring supports with different orientation that resulted in no obvious slicing errors

Hall C – NPS

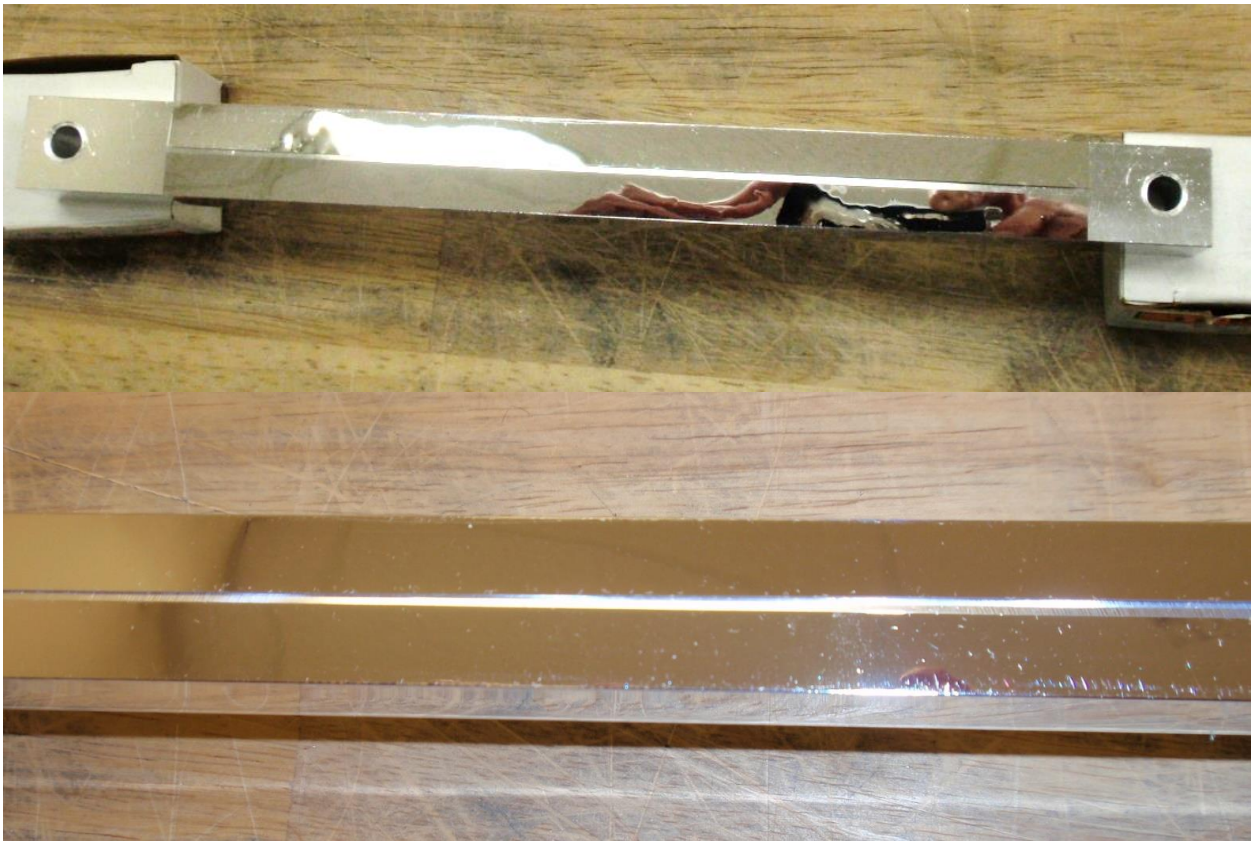
Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, and Marc McMullen

- Continued hardware monitoring program Phoebus user interface; laying out crystal zone's temperature monitoring
- Revising spreadsheet of LabVIEW VIs and subVIs that need to be developed for hardware interlock program
  - ✶ Adding EPICS screens to be developed for the hardware interlock system's EPICS user interface based on LabVIEW user interface

Hall D – JEF

Mary Ann Antonioli, Aaron Brown, George Jacobs, and Mindy Leffel

- Cut 100 ESR films
- ESR film pre-shaping – 161 of 1600 complete (~10%)

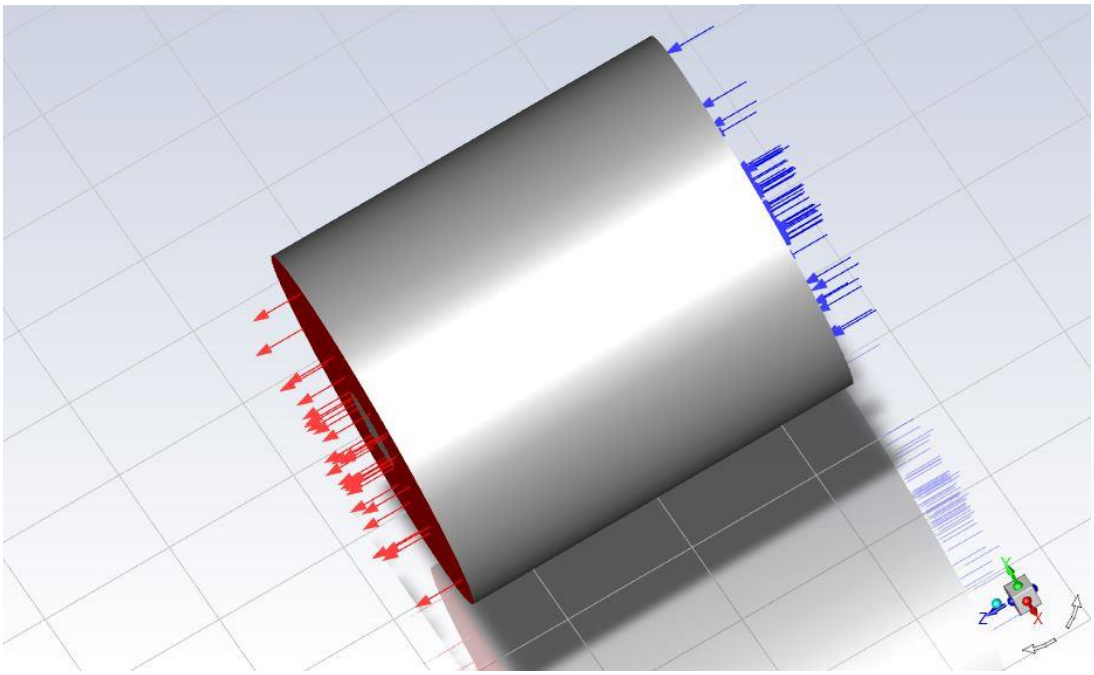


Pre-shaped ESR film on aluminum form (top); closer view (bottom)

EIC

Pablo Campero, Brian Eng

- Generated new project to work with Ansys Fluid Flow Fluent software
  - ✶ Configured materials for elements of the model; using Al and steel for analysis as unable to find material properties for Si and Be
  - ✶ Configured Cell Zone conditions; defines fluid and solid domains for model
  - ✶ Configuring boundary conditions for the model



Be section model (Be pipe, Si sensor L1, and enclosure) with implemented boundary conditions in Ansys Fluid Flow Fluent

- Reviewing ATLAS CDF and testing publications – uses carbon fiber inner support tube and aerogel around beam pipe
- Attended ATHENA tracking meeting

DSG R&D – EPICS Alarm System

Peter Bonneau

- Development of an Input/Output Controller (IOC) using EPICS base 3.14
  - ✶ The IOC will be used for the development and testing of the alarm system
  - ✶ Successfully tested channel access code – required debugging and compiling channel access' C++ code to comply with updated compiler rules
- Debugging communication between Apache Kafka and Phoebus
  - ✶ In the Phoebus alarm system, Kafka serves as a messaging communication link between sections of the alarm system code
  - ✶ When Kafka attempts a connection to Phoebus, the system reports an error in the alarm command partition